

## REPORTER PLASMID TO IDENTIFY CANCER STEM CELLS

### SUMMARY

The National Cancer Institute's Laboratory of Cancer Biology and Genetics seeks partners to co-develop lentiviral plasmids, a research tool for visualizing and purifying cancer stem cells.

### REFERENCE NUMBER

E-141-2011

### PRODUCT TYPE

- Diagnostics

### KEYWORDS

- lentiviral
- plasmid
- reporter construct
- Sox2
- Oct4

### COLLABORATION OPPORTUNITY

This invention is available for licensing.

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### DESCRIPTION OF TECHNOLOGY

Cancer stem cells are a minority population of cells in tumors that initiate and sustain the cancer and which are resistant to therapy; they may cause tumors to recur after curative treatment. Current therapies generally do not target cancer stem cells.

Scientists at the National Cancer Institute [Laboratory of Cancer Biology and Genetics](#) have developed an efficient lentiviral plasmid to visualize and purify cancer stem cells, which is useful for screening compounds that specifically kill or inhibit cancer stem cells. The NCI lentiviral plasmid can identify the putative cancer stem cell population through the expression of fluorescent or luminescent proteins and has the potential to advance new therapies. The key feature of the plasmid is a reporter system that only detects cells expressing the core stem cell transcription factors Sox2 and Oct4.

## POTENTIAL COMMERCIAL APPLICATIONS

- Visualize, quantify and purify cancer stem cells.
- Monitor cancer stem cells in transplanted tumors in vivo. Identify cancer stem cells in high throughput screening of libraries for compounds that specifically inhibit or kill cancer stem cells.
- Optimize therapeutic regimens in preclinical models.
- Potential to support precision medicine approach by screening therapeutics for efficacy against cancer stem cells in patient-derived xenografts.

## COMPETITIVE ADVANTAGES

- Visualization of cancer stem cells by functional property rather than by use of highly variable cell surface markers.
- Flexible, modular gateway cloning technology allows constructs with alternative reporters to be readily generated.
- Independent of cell-of-origin of tumor.
- Cancer stem cell behavior can be monitored in real-time.

## INVENTOR(S)

[Lalage Wakefield](#) (NCI) and Binwu Tang (NCI)

## DEVELOPMENT STAGE

- Pre-clinical (in vivo)

## PUBLICATIONS

*Stem Cell Reports*, Volume 4, Issue 1, 13 January 2015, Pages 155–169.

## PATENT STATUS

- **U.S. Filed:** Research Material--Patent prosecution is not being sought for this invention.

## THERAPEUTIC AREA

- Cancer/Neoplasm